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ABSTRACT

In the first part of this paper, estimates of present values or rates of return to education for women on lifetime earnings have been calculated. Subsequently, returns to education for women which derive from their husband's income and their family income are examined. Finally, some implications of the results are discussed. In the first section, data are from the 1/1000 sample of the 1969 Census. For women working full-time, the internal rate of return varies from 6% to 11% for whites, and from 6% to more than 50% for Negroes. Two measures of family income are calculated. The first is the earnings of the woman plus the total income of her husband weighted by the probability that the husband is present at each age. The second measure differs from the first in that only half of the weighted husband's income and family income appear less susceptible to the criticisms raised earlier about estimates f returns through women's earnings in terms of magnitude and stability. Implications of these results include: (1) College education for women was an attractive alternative in 1960; (2) The returns to graduate training as measured through women's earnings appear much higher than the returns through family income; and (3) A family income maximization model may be useful in further examination of the demand for education by women. (Author/CK)

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# THE RETURNS TO EDUCATION FOR WOMEN

Lee Benham

Although the relationship between women's education and earnings is a question of obvious importance in a society in which women constitude an increasing share of the college population and also an increasing share of the labor force, few attempts have been made to estimate the returns to education for women. Improved knowledge in this area should lead to a better understanding of such phenomena as women's levels of educational attainment, secular changes in these levels, and women's labor force participation. In addition, such matters as the returns to women's education through marriage, women's age at first marriage, fertility patterns, and women's nonmarket productivity may be fruitfully examined in this context.

Almost without exception, past studies of the returns to education for men have examined the relationship between men's level of education and their market earnings.[1] Estimates of present values or rates of return on

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[1] Gary Becker, Human Capital (New York: National Bureau of Economic Research, distributed by Columbia University Press, 1964), pp. 100-102.

Richard Freeman, "The Labor Market for High-Level Manpower." (Unpublished Ph.D. dissertation, Department of Economics, Harvard University, 1969.)

Milton Friedman and Simon Kuznets, Income from Independent Professional Practice (New York: National Bureau of Economic Research, 1954).

Alex Maurizi, Economic Essays on the Dental Profession (Iowa City: College of Business Administration, University of Iowa, reprinted by Bureau of Business and Economic Research, 1969).

George Stigler and David Blank, The Demand and Supply of Scientific Personnel (New York: National Bureau of Economic Research, 1957).

Yoram Weiss, "Allocation of Time and Occupational Choice." (Unpublished Ph.D. dissertation, Department of Economics, Stanford University, 1968.)

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lifetime earnings have generally been calculated.[1] In the first part of this paper, similar estimates are calculated for women. Subsequently, the returns to education for women which derive from their husbands' income and their family income are examined. Finally, some implications of the results are discussed.

## I

The returns to education for women as measured though their own market earnings are estimated in this first section. Data are from the 1/1000 sample of the 1960 Census. Since a large proportion of women are active in the labor force only part of the time, there is some question as to the appropriate measure of women's earnings to use. Three measures are examined below: earnings for all women, earnings for women working full-time, and earnings for women never married. Table 1 shows these earnings by race for 11, 12, 13-15, 16, and 17+ years of education completed. Internal rates of return for a subset of these groups are shown in Table 2.

For women working full-time, the internal rate of return varies from 6% to 11% for whites, and from 6% to more than 50% for Negroes. Labor force participation increases with education so the returns are higher in all cases when education-specific labor force participation rates are used.[2]

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[1] The limitations of looking only at the pecuniary cost and earnings streams are well known. There is the problem of separating the consumption and investment aspects of schooling. Also, such factors as individual ability, family influence on learning outside of school, quality of school, and acquired tastes all may have an impact on both educational attainment and earnings.

[2] Estimates for never married women were included because of the conventional explanation for the flat age profile of women's hourly earnings: the lack of investment in training on the job. Since women who never married are more likely to be permanent members of the labor force, both they and their employers have more incentive to invest in such training. On this basis, the age profile of hourly earnings should rise more rapidly for the unmarried group, unless there are other, offsetting factors. The estimates of hourly earnings here show only a slightly greater increase by age for this group than for women in general. In addition, when hourly earnings were

TABLE 1

MEAN 1959 EARNINGS AND PRESENT VALUES AT AGE 18
OF LIFETIME EARNINGS FOR ALL WOMEN, WOMEN WORKING FULL-TIME, AND NEVER MARRIED WOMEN
BY RACE AND LEVEL OF EDUCATIONAL ATTAINMENT[a]

| Years of Schooling Completed | Mean Earnings of All Women, in Dollars[b] | Mean Earnings of Women Working Full-Time, in Dollars[b] | Mean Earnings of Never Married Women, in Dollars[b] | Present Value (at Age 18) in $1,000's of Earnings of All Women at Discount Rate of 0% | 5% | 10% | Present Value (at Age 18) in $1,000's of Earnings of Working Women Full-Time at Discount Rate of 0% | 5% | 10% | Present Value (at Age 18) in $1,000's of Earnings of Never Married Women at Discount Rate of 0% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | White[c] | | | | | | | | |
| 11 Years | 884 | 2861 | 1931 | 44.0 | 14.8 | 7.3 | 132.1 | 50.0 | 26.9 | 118.4 | 43.7 | 22.5 |
| 12 Years | 1104 | 3116 | 2322 | 54.3 | 20.4 | 11.3 | 146.5 | 53.3 | 28.0 | 130.6 | 48.6 | 25.7 |
| 13-15 Yrs. | 1291 | 3560 | 2595 | 61.7 | 21.2 | 10.6 | 159.7 | 54.2 | 26.1 | 145.5 | 49.9 | 23.6 |
| 16 Years | 1722 | 4283 | 3442 | 81.5 | 25.0 | 11.3 | 181.1 | 59.3 | 27.0 | 170.4 | 56.3 | 25.4 |
| 17+ Yrs. | 3243 | 5184 | 4085 | 133.6 | 40.6 | 17.1 | 205.7 | 62.4 | 26.2 | 176.3 | 55.9 | 23.8 |
| | | | | Negro[d] | | | | | | | | |
| 11 Years | 794 | 1902 | 75' | 41.1 | 14.0 | 6.7 | 81.5 | 31.2 | 16.7 | e | e | e |
| 12 Years | 978 | 2249 | 1006 | 44.7 | 16.7 | 8.4 | 96.0 | 36.7 | 19.5 | e | e | e |
| 13-15 Yrs. | 1151 | 2647 | 1305 | 48.8 | 18.2 | 9.0 | 120.3 | 38.1 | 17.1 | e | e | e |
| 16 Years | 2393 | 3562 | 2478 | 127.3 | 37.3 | 15.8 | 159.8 | 50.7 | 22.7 | e | e | e |
| 17+ Yrs. | 3738 | 4831 | 5412 | e | e | e | e | e | e | e | e | e |

[a] Calculated for females of ages 18-65 not enrolled in school at the time of the 1960 census.

[b] Mean wage and salary and self-employment income for women age 18 and over in 1959.

[c] Excluding those with Spanish surnames.

[d] The sample size is quite small for some of the Negro education cohorts especially for women working full-time and never married women. See tables in Appendix.

[e] Number of observations too small to calculate present values.

TABLE 2

INTERNAL RATES OF RETURN TO WOMEN'S EDUCATIONAL ATTAINMENT
ESTIMATED FROM EARNINGS OF WOMEN

| | All Women | | | Women Working Full-Time | | |
|---|---|---|---|---|---|---|
| | Lower Schooling Level of Comparison | | | Lower Schooling Level of Comparison | | |
| Higher Schooling Level of Comparison | 12 | 13-15 | 16 | 12 | 13-15 | 16 |
| **White** | | | | | | |
| 13-15 | 7% | | | 6% | | |
| 16 | 10% | 14% | | 9% | 11% | |
| 17+ | 18% | 25% | 44% | 8% | 10% | 8% |
| **Negro[a]** | | | | | | |
| 13-15 | 18% | | | 6% | | |
| 16 | 35% | >50% | | 15% | >50% | |

[a]Sample size for Negroes is too small to estimate rate of return to 17+ years of education.

Although most of these estimates do not appear unreasonable, there are several characterisits of the earnings profile for women which suggest that estimates of this kind should be viewed with caution. First, the estimates are not very robust across the different labor force participation categories. It has been argued that full-time earnings are a better measure of the full returns. However, the extent to which education influences nonmarket productivity has not been established.

Second, the absolute differences between earnings by education levels are much smaller for women than for men. A consequence of this is that the estimated rates of return are very sensitive to small absolute changes in the estimated costs of training and foregone earnings. There are significant differences in the calculated rates of return for women when costs of training vary as little as $250 a year.[1] Since there is considerable uncertainty about the costs of training and foregone earnings, these specific estimates should be viewed as having large standard errors.

Third, at least to this observer, the differences in earnings by level of education measured here appear small in comparison with the differences in life styles associated with different levels of women's education.

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calculated for women working full-time, with no children, living outside the South, and living in cities with more than 5,000 inhabitants, there appeared to be little difference between the age profile of hourly earnings for women in this group and women in general.

[1]For example, the internal rate of return for four years of college as compared to high school falls from 10% to approximately 8%, for all women if costs go up $250 per year.

II

An alternative approach is to consider as a measure of "full" income the husband's or the family income, since women's life styles appear to be more a function of their husbands' earnings than of their own. This approach has been suggested earlier,[1] but little empirical work has been undertaken in this area. To examine this approach, women's income, husbands' income, and family income by race and educational attainment of women are shown in Table 3.[2]

If the view is taken that only the pecuniary returns should be considered in these calculations, then care must be taken to avoid double-counting, i.e., attributing the same income to both husband and wife.[3] However, is a measure of full income also includes the returns to nonmarket activity, then it is nc longer obvious that this problem exists. If the nonmarket productivity of the husband is positively related to his earnings and his wife shares this nonmarket output, then including all the husband's pecuniary earnings in a measure of the returns to the wife's education is not necessarily double-counting. Depending on the effects of education on nonmarket productivity, the returns may even be some multiple of the total pecuniary returns both of the husband and the wife.[4]

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[1] Becker, op. cit., p. 102.

[2] The relationship between women's education and husband's and family income may be in part spurious. Such factors as family background, social class, and parental family income are all associated with educational attainment, with the type of person selected as spouse, and with lifetime income. Thus the question of the net contribution of women's education to own or husbands' earnings or to family income cannot be settled here. This problem is similar to that associated with attempts to separate out the returns to ability and to education.

[3] Becker, op. cit., p. 101.

[4] I appreciate Gary Becker's assistance, on this point.

Two measures of family income are calculated here. The first is the earnings of the women plus the total income of her husband weighted by the probability that the husband is present at each age. The second measure differs from the first in that only half of the weighted husband's income is included.

For white women, the levels of husbands' and family income are higher and the differences by women's educational categories are greater than for women's earnings alone. The difference ($3950) between the annual incomes of husbands of high school and college graduates is almost as large as the level ($4283) of full-time earnings of female college graduates, and several times as large as the difference between the earnings of women at these two educational levels working full-time ($1167). The income of husbands rises consistently with wives' education, except for women with more than 16 years of schooling.

For Negro women, the pattern is not the same. Their husbands' incomes are lower and generally differ less across wives' education then do the women's own earnings. Also, a lower percentage of Negro women are married with husband present. There is a differential of $1270 between the average annual earnings of the husbands of Negro women with 12 and 16 years of education, for those married with husband present. This compares with a differential of $1415 in the women's own earnings and of $1313 in earnings for women working full-time.

Present value estimates are shown in Table 4 and internal rates of return in Table 5. For white women, the returns to college appear to be higher when their husbands' income are considered than when their own earnings are used. This is particularly true for those with one to three years of college. However, the returns to graduate education appear lower by this measure. For

TABLE 3

MEAN EARNINGS, HUSBANDS' INCOME, AND FAMILY INCOME OF WOMEN BY RACE AND LEVEL OF EDUCATIONAL ATTAINMENT

| Years of Schooling Completed | Mean 1959[b] Earnings in Dollars | Percent Married with Husband Present | Mean Education of Husband in Years | Mean 1959 Total Income of Husband in Dollars For Women with Husbands | Mean 1959 Family Income[a] Including Weighted Husbands' Income | Mean 1959 Family Income Including One Half of Weighted Husbands' Income | N |
|---|---|---|---|---|---|---|---|
| | | | White[c] | | | | |
| 11 Years | 884 | 76.0 | 10.8 | 5897 | 5366 | 3125 | 2792 |
| 12 Years | 1104 | 76.6 | 12.0 | 6684 | 6224 | 3664 | 16259 |
| 13-15 Yrs. | 1291 | 73.8 | 13.6 | 8449 | 7526 | 4409 | 4905 |
| 16 Years | 1722 | 72.3 | 15.3 | 10634 | 9410 | 5566 | 2206 |
| 17+ Yrs. | 3243 | 51.7 | 15.7 | 10415 | 8628 | 5935 | 812 |
| | | | Negro[d] | | | | |
| 11 Years | 794 | 60.3 | 9.2 | 3152 | 2695 | 1744 | 363 |
| 12 Years | 978 | 57.0 | 10.5 | 3621 | 3042 | 2010 | 896 |
| 13-15 Yrs. | 1151 | 53.7 | 11.1 | 4128 | 3368 | 2259 | 218 |
| 16 Years | 2393 | 56.3 | 13.4 | 4891 | 5147 | 3770 | 103 |
| 17+ Years | 3738 | 59.5 | 14.0 | 4220 | 6249 | 4994 | 42 |

[a]Earnings of woman plus total income of husband weighted for probability of marriage at each age.

[b-d]See Table 1.

TABLE 4

PRESENT VALUES AT AGE 18 OF VARIOUS MEASURES OF LIFETIME INCOME FOR WOMEN
BY RACE AND LEVEL OF EDUCATIONAL ATTAINMENT AT DISCOUNT RATES OF 0%, 5%, and 10%, IN $1,000's[a]

| Years of Schooling Completed | Earnings of All Women | | | Earnings of Women Working Full-Time | | | Weighted Income of Husbands[c] | | | Family Income[d] | | | Family Income Including only Half of Husband's Income[e] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0% | 5% | 10% | 0% | 5% | 10% | 0% | 5% | 10% | 0% | 5% | 10% | 0% | 5% | 10% |
| | | | | | | | White[b] | | | | | | | | |
| 11 Years | 44.0 | 14.8 | 7.3 | 132.1 | 50.0 | 26.9 | 213.3 | 77.3 | 38.8 | 257.3 | 92.1 | 46.1 | 150.6 | 53.4 | 26.7 |
| 12 Years | 54.3 | 20.4 | 11.2 | 146.5 | 53.3 | 28.0 | 239.3 | 83.6 | 40.0 | 293.6 | 104.0 | 51.2 | 173.9 | 62.2 | 31.2 |
| 13-15 Yrs. | 61.7 | 21.2 | 10.6 | 159.7 | 54.2 | 26.1 | 286.8 | 97.5 | 44.1 | 348.5 | 118.7 | 54.7 | 205.1 | 70.0 | 32.6 |
| 16 Years | 81.5 | 25.0 | 11.3 | 181.1 | 59.3 | 27.0 | 339.8 | 108.6 | 45.4 | 421.3 | 133.6 | 56.7 | 251.4 | 79.3 | 34.0 |
| 17+ Yrs. | 133.6 | 40.6 | 17.1 | 205.7 | 62.4 | 26.2 | 220.2 | 71.5 | 29.6 | 353.8 | 112.1 | 46.7 | 243.7 | 76.4 | 31.9 |
| | | | | | | | Negro | | | | | | | | |
| 11 Years | 41.1 | 14.0 | 6.7 | 81.5 | 31.2 | 16.7 | 90.9 | 32.2 | 16.1 | 132.0 | 46.2 | 22.8 | 86.5 | 30.1 | 14.7 |
| 12 Years | 44.7 | 16.7 | 8.4 | 96.0 | 36.7 | 19.5 | 95.2 | 35.4 | 17.7 | 139.9 | 52.1 | 26.1 | 92.3 | 34.4 | 17.2 |
| 13-15 Yrs. | 48.8 | 18.2 | 9.0 | 120.3 | 38.1 | 17.1 | 99.5 | 35.2 | 16.5 | 148.3 | 53.4 | 25.5 | 98.6 | 35.8 | 17.2 |
| 16 Years | 127.3 | 37.3 | 15.8 | 159.8 | 50.7 | 22.7 | 121.0 | 43.2 | 19.0 | 248.3 | 80.5 | 34.8 | 197.8 | 58.9 | 24.3 |

[a] Calculated for females of ages 18-65 not enrolled in school at the time of the 1960 census.

[b] Excluding those with Spanish surnames.

[c] Income of husbands of women in given age and education cell weighted by the probability that women in that cell are married.

[d] Family income = earnings of all women + weighted income of husbands.

[e] Family income including only half of husbands' income = earnings of all women + ½(weighted income of husbands).

TABLE 5

INTERNAL RATES OF RETURN TO WOMEN'S EDUCATIONAL ATTAINMENT
ESTIMATED FROM HUSBANDS' INCOME

| Higher Schooling Level of Comparison | Lower Schooling Level of Comparison | | |
|---|---|---|---|
| | 12 | 13-15 | 16 |
| **White** | | | |
| 13-15 | 17% | | |
| 16 | 14% | 12% | |
| 17+ | negative | negative | negative |
| **Negro** | | | |
| 13-15 | 5% | | |
| 16 | 12% | 18% | |

Negro women, incorporation of their husbands' income does not much alter the pattern established by their own earnings.

In general, the estimates of returns to education through husbands' income and family income appear less susceptible to the criticisms raised earlier about estimates of returns through women's earnings, in terms of magnitude, stability, and so forth.

## III

What are some implications of these results? Are they in accordance with what we observe happening? Where the implications of the various returns of results differ, which appear to be more consistent with observed phenomena?

First consider the area of undergraduate education for women. The returns through women's earnings and husbands' and family income all suggest that college education for women was an attractive alternative in 1960. The family incomes measures showed a particularly high return.

The rapid growth in the number of women in higher education over the decade 1960-69 is consistent with these results. There was an increase in the absolute number of women in college, an increase in the proportion of high school female graduates attending college, and for whites a rapid increase in the ratio of female to male college students. Without estimates of family income by level of women's education for earlier years, it is not clear that the estimates for 1959 represented higher than normal returns. Unfortunately, such information for earlier years is very difficult to obtain. There is some information available for 1950 and 1960 on the proportion of women who were married by level of educational attainment. (Table 6.) The likelihood of marriage was lower for women with college training in 1950 than in 1960. Consequently, if husbands' income differentials across wives'

TABLE 6

PERCENTAGE OF WOMEN OF AGES 30-34 WHO WERE MARRIED WITH HUSBAND PRESENT, BY LEVEL OF EDUCATIONAL ATTAINMENT, in 1950 and 1960.

| Year | Years of Education Completed by Woman | | |
|---|---|---|---|
| | 12 | 13 - 15 | 16 or more |
| 1950[a] | 14.3 | 82.2 | 75.25 |
| 1960[b] | 86.5 | 85.4 | 82.6 |

[a]Source: United States Bureau of the Census, U. S. Census of Population, 1950, Volume IV, Special Reports, Part 5, Chapter B, Education, p. 63.

[b]Source: 1/1000 Census File for 1960. See pp. XV-XXIV in Supplementing Appendix. Ages here are 31 to 35.

educational levels were no lower in 1950 than in 1960, expected family returns to women's college education were lower in 1950.

A second area to consider is that of graduate education for women. The returns to this training as measured through women's earnings appear much higher than the returns measured through family income, which appeared to be quite low in 1960. In fact, while the ratio of female to male B.A. recipients increased from 1960 to 1964 (from .54 to .68), the ratio of female to male M.A. recipients stayed approximately the same, as did the ratio of female to male Ph.D. recipients (from .117 in 1960 to .121 in 1964).[1] These results lend some weak support to the family income maximization hypothesis for women.

In a third, slightly different context, some of the implications of these various measures of returns can be pursued by comparing the returns to education in terms of own earnings, husbands' income, and family income for registered nurses and for women with a general college education, and examining the growth rate of female entrants into nursing training and general college programs. Table 7 shows the returns for nurses and nonnurses with comparable years of education and the growth rates of entrants into nursing schools and colleges during the 1960's. Nursing looks reasonably attractive when women's earnings streams alone are considered, but quite unattractive when the expected husbands' and family incomes are considered. The low growth rate of students entering nursing programs is consistent with these latter rates of return. Although many other factors influenced these flows of students,[2] the returns through family income are consistent with the

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[1] See Table 1.3 in the appendix.

[2] See Lee Benham, "An Economic Analysis of the Labor Market for Registered Nurses," (unpublished Ph.D. dissertation, Department of Economics, Stanford University, 1970).

TABLE 7

PRESENT VALUE AT AGE 18 OF VARIOUS MEASURES OF LIFETIME INCOME FOR WOMEN AT DISCOUNT RATES OF 0%, 5%, AND 10%, IN $1,000s[a]

| Years of Schooling Completed | Earnings of All Women | | | Earnings of Women Working Full-time | | | Weighted Income of Husbands[b] | | | Family Income[c] | | | Annual Rate of Increase in New Entrants During 1958-1960 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0% | 5% | 10% | 0% | 5% | 10% | 0% | 5% | 10% | 0% | 5% | 10% | |
| **Registered Nurses** | | | | | | | | | | | | | |
| 13-15 years | 103.8 | 35.0 | 17.4 | 171.6 | 59.7 | 29.3 | 170.5 | 66.9 | 32.8 | 274.3 | 101.9 | 50.2 | 1.3%[d] |
| 13-16 years | 105.8 | 35.0 | 16.9 | 171.5 | 57.7 | 27.2 | 171.0 | 66.0 | 32.7 | 276.8 | 101.9 | 49.6 | 3.4%[e] |
| **All Women Except Registered Nurses** | | | | | | | | | | | | | |
| 12 years | 53.4 | 20.2 | 11.2 | 155.6 | 56.9 | 30.0 | 238.4 | 83.2 | 39.8 | 293.1 | 103.7 | 51.1 | 10.8%[f] |
| 13-15 years | 59.1 | 20.2 | 10.1 | 170.0 | 58.1 | 28.2 | 291.8 | 99.1 | 44.7 | 352.0 | 119.5 | 55.0 | 12.0%[g] |
| 13-16 years | 65.6 | 21.7 | 10.5 | 175.7 | 60.1 | 29.0 | 309.8 | 103.4 | 45.8 | 375.4 | 125.1 | 56.3 | 12.0%[g] |
| 16 years | 80.4 | 24.6 | 11.1 | 186.8 | 62.9 | 29.3 | 343.9 | 109.5 | 45.6 | 424.5 | 134.2 | 56.8 | 12.0%[g] |

[a]Calculated from data for females, excluding Negroes, of age 18 and over, not enrolled in school at the time of the 1960 Census. From 1/1000 sample of Census 1960.

[b]Income of husbands in each women's age, occupation, and education cell weighted by the probability that women in that cell are married.

[c]Income of all women and weighted income of husbands.

[d]For new entrants into diploma nursing programs.

[e]For new entrants into all nursing programs.

[f]For female graduations from high school.

[g]For new female entrants into college.

occupational choice trend shown here while the returns through own earnings are not. Furthermore, other studies have found that nurses do not appear to respond in the expected manner to changes in rates of return on earnings.[1]

These results, fragmentary as they are, suggest that a family income maximization model may be useful in further examinations of the demand for education by women. They also suggest that estimates of returns to education calculated from women's earnings should be interpreted with caution, particularly in drawing inferences about resource allocation in the labor market for women or about women's behavioral responses to different rates of return. Women appear to receive substantial returns from higher education, but not directly through their own earnings. As a consequence, we should not be surprised to find that the supply response of women to changing pecuniary returns on earnings may be weak (at least for whites). Shortages and surpluses as conventionally defined by economists may persist over long periods of time.

## IV

While a strong relationship between women's education and family income has been found, the reasons for the higher family income are not entirely clear. Husbands' earnings may be higher on average as women increase their education either because they marry more productive men or because the men become more productive as a consequence of marrying women with more education. There are several issues for which it would be useful to separate out the effects of selectivity from contributions to market productivity by the women.

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[1] See Donald E. Yett, "Lifetime Earnings for Nurses in Comparison with College Trained Women." Inquiry, V (December, 1968), 35-70, and "Causes and Consequences of Salary Differences in Nursing," Inquiry, VII (March, 1970), 78-99.

If these higher family returns are due largely to selectivity on the part of the woman, then the social pecuniary returns to women's education will be less than if their education is reflected in raising the productivity of the men they marry.

The distinction between selectivity and productivity also becomes relevant from the standpoint of understanding the marriage market and the process of mate selection. The returns to marriage for the man and woman will depend in part upon the complementarity of their inputs in the production of "commodities" in the home. The related issue of the complementarity of husbands' and wives' education in terms of each of their market activities is raised here. It does not seem unreasonable that a woman's education would be in part reflected in her husband's earnings, independent of his own level of educational attainment and other characteristisc. However, to establish the net contribution of the woman's education is not an easy task. Many of the problems are similar to those which arise in attempts to separate the effects of ability and education on earnings. No claim is made that these problems are solved here. Nevertheless, it appears useful to obtain some rough estimates of the changes in earnings which are associated with changes in education of members of the family.

Two estimates were made. In the first, earnings and wage rates were calculated from the 1/1000 sample of the 1960 Census for men and women in families in which husband and wife each had either 12 or 16 years of education. (Table 8.) The earnings and wage rate of husbands at both levels of education increase as the wife's education increases from 12 to 16 years. The earnings per hour of women increase in one case (12 years) and decrease in the other (16 years) as husband's education increases.

Several demographic characteristics were accounted for in the second estimates. (Table 9.) Again the incomes of men rise with their own education

TABLE 8

CHARACTERISTICS OF HUSBANDS AND WIVES,
AGE 18 AND OVER, WHITE, MARRIED WITH SPOUSE PRESENT

| Years of Education Completed by Husband | | Years of Education Completed by Wife: 12 | | 16 | |
|---|---|---|---|---|---|
| | | Husband | Wife | Husband | Wife |
| 12 | Earnings | 5998 | 832 | 6984 | 1571 |
| | Other Income | 483 | 108 | 754 | |
| | Wage Rage | 2.80 | 1.54 | 3.18 | 2.38 |
| | % Employed Last Year | .98 | .42 | .98 | .54 |
| | Hours Last Week | 45.5 | 36.5 | 45.8 | 34.7 |
| | Weeks Last Year | 49.0 | 35.9 | 49.8 | 36.2 |
| | Earnings Age 41-50 | 6855 | | 7745 | |
| | N | 4989 | 5011 | 240 | 239 |
| 16 | Earnings | 8419 | 657 | 9763 | 938 |
| | Other Income | 1039 | 197 | 1782 | |
| | Wage Rate | 3.97 | 1.84 | 4.57 | 2.29 |
| | % Employed Last Year | .95 | .31 | .97 | .39 |
| | Hours Last Week | 45.0 | 34.2 | 45.4 | 33.2 |
| | Weeks Last Year | 49.7 | 34.7 | 48.8 | 31.9 |
| | Earnings Age 41-50 | 10392 | | 12211 | |
| | N | 771 | 780 | 493 | 511 |

TABLE 9

MEAN ANNUAL INCOME OF HUSBAND BY EDUCATION OF HUSBAND AND WIFE FOR WOMEN AT AGE 40[a]

| Years of Education Completed by Husband | Years of Education Completed by Wife | | | | |
|---|---|---|---|---|---|
| | 11 | 12 | 13-15 | 16 | 17 |
| < 11 | 6548 (46.6%)[b] | 6614 (30.5%) | 8530 (18.5%) | 7325 (5.6%) | 6075 (8.2%) |
| 11 | 7431 (16.8%) | 6883 (7.0%) | 10828 (3.8%) | 6748 (1.2%) | 3542 (2.0%) |
| 12 | 7526 (25.6%) | 7716 (40.0%) | 10379 (24.8%) | 12186 (19.5%) | 5728 (9.7%) |
| 13 | 8539 (2.4%) | 8599 (5.3%) | 11159 (7.5%) | 12516 (4.3%) | 10743 (2.6%) |
| 14-15 | 9819 (4.5%) | 9703 (7.7%) | 12004 (15.7%) | 13413 (10.2%) | 9598 (10%) |
| 16 | 14869 (1.9%) | 10250 (6.3%) | 14739 (14.0%) | 16840 (29.7%) | 14402 (12%) |
| 17+ | 17616 (2.1%) | 12370 (3.3%) | 15981 (15.7%) | 17468 (29.4%) | 14944 (56%) |
| N | 779 | 5536 | 1488 | 656 | 196 |
| Mean Unadjusted Income of Husband | 6813 | 7438 | 9710 | 12258 | 11212 |

Footnotes to Table 9

[a]These incomes were estimated using the 1/1,000 Census sample for 1960. Five subsamples were taken, one for each education level, 11, 12, 13-15, 16, 17+, of white females of ages 30-50, living outside the south and married with husband present. Then for each of these subsamples, the coefficients of a simple linear equation were estimated by ordinary least squares. The dependent variable was total income of husband in 1959. The independent variables were: city size of residence, age, age at first marriage, whether foreign born or not, whether born in the south or not, whether born in the state currently residing in or not, and education of the associated person. The estimates of husbands' incomes were calculated using this equation. See appendix for a more complete discussion.

[b]Percent of women with this level of education who have husbands with this level of education.

and with the education of their wives. The magnitude of the increase is more dramatic here. For several categories containing substantial parts of the total population, the income of men increases more dramatically with wives' education, holding husbands' education constant, than it does with husbands' education, holding wives' education constant. For women with 12 years of education with husbands with 12 years of education, husbands' mean income is $7,716. When the man's education is 16 years and the wife's is 12, his mean income is $10,250. When her education is 16 years and his is 12, his mean income is $12,186. When both have 16 years of education, his mean income is $16,840. Other combinations can be examined in the table. In general, some undergraduate college education for the woman is associated with a substantially higher income of her husband.[1] Graduate training for women appears to be associated with lower husbands' income.[2]

While there are differences between the magnitude of the estimates obtained they both suggest a substantial association between women's education and husbands' earnings. However, the extent to which the differences in earnings are due to selectivity and increase productivity is uncertain. A male with only a high school education who marries a female college graduate is likely to differ from the average high school graduate even before marriage. Devising tests to estimate the separate impact of these two effects, however, is not a simple matter. In one test, the relationship

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[1]The aberrant cases generally involve a small sample size. This same pattern was found in several other estimates of the partial effect of women's education on husbands' earnings.

[2]There is presumably some simultaneous equations bias here: women's education may be initiated or continued after marriage in part as a function of the earnings and education of the husband. There is weak evidence that, ceteris paribus, the later the age of marriage, the lower the husband's income. See Appendix I, Table 1.2 variables AGEM17-AGEM26.

between age of women at first marriage and the association between husband's earnings and wife's education was examined. If partner selectivity was the primary explanation for the results in Tables 8 and 9, then for any given combination of husbands' and wives' education, the husbands of women who married during college should have higher earnings than the husbands of women who married before they went to college. Several estimates were made; in no case were there significant differences between husbands' earnings for those women who married in college and those who married before or after (except for those women who married after age 26). This would suggest that women's education per se affects male earnings. However, this test is crude, and it is not difficult to think of alternative explanations for these age-at-marriage results. Further work will be required before we can make any confident assertions about the relative magnitudes of these two effects. Nevertheless, if only a portion of the differences in husbands' income observed here can be attributed to women's productivity, as distinguished from their selectivity of marriage partners, this has important implications for the social returns to education for women and the incentives to marry well-educated partners.

# APPENDIX I

The following procedure was used to obtain estimates of husband's income presented in Table 4. The data is from the 1/1,000 census sample file for 1960. Five subsamples were selected, one for each level of education attainment by the woman, 11 years, 12, 13-51, 17, and 17+. These samples included white females (excluding those with Spanish surname), living outside the south, age 30-50, married with spouse present, not at school. The income of husbands was estimated as a function of the husbands' education and characteristics of the wives for each subsample. The coefficients were estimated using ordinary least squares.

The variables names and definitions are given below. To estimate average incomes at age forty, the following assumptions were made: all women lived in cities of population 100,000 were never divorced, were married at age 20, or 21, were 40 years of age, were born outside the south, were not foreign born, lived in the same location for seven years, and were born in the same state. Alternative assumptions can be used to calculate estimates with these coefficients.

TABLE 1.1

DESCRIPTION OF VARIABLES USED IN REGRESSION EQUATIONS TO ESTIMATE HUSBANDS INCOME

| Variable Name | Variable Number | Census Tape Variable Number | Description of Variables | Recode |
|---|---|---|---|---|
| SIZPL | 1 | #3 | Size of Place Recode variable to log of midpoints | =log 10 1250 if #3=1-3<br>=10g 10 2,000,000 if #3=12 |
| RCENM | 2 | #4, #5 | Residence in Central City of SMSA | =1 if #4≠ 1 & #5=5-8<br>=0 otherwise |
| RURBM | 3 | #4, #5 | Outside of Central City in SMSA | =1 if #4≠ 1 & #5=9-12<br>=0 otherwise |
| RURBN | 4 | #4, #5 | Rural in SMSA | =1 if #4=1 & #5≠ 1-2<br>=0 otherwise |
| RRNFN | 5 | #4, #5 | Rural nonfarm, outside SMSA | =1 if #4=1 & #5=2<br>=0 otherwise |
| RRFN | 6 | #4, #5 | Outside place, outside SMSA | =1 if #4=1 & #5=1<br>=0 otherwise |
| MARST | 7 | #10 | Marital status, married more than once | =1 if yes<br>=0 otherwise |
| AGEM17 | 8 | #6, #8, #9 | Age at first marriage | =1 if 17 years or under<br>=0 otherwise |
| AGEM18 | 9 | #6, #8, #9 | " " " " | =1 if 18 or 19 years<br>=0 otherwise |
| AGEM20 | 10 | #6, #8, #9 | " " " " | =1 if 20 or 21 years<br>=0 otherwise |
| AGE22 | 11 | #6, #8, #9 | " " " " | =1 if 22 or 23 years<br>=0 otherwise |
| AGE24 | 12 | #6, #8, #9 | " " " " | =1 if 24 or 25 years<br>=0 otherwise |
| AGE26 | 13 | #6, #8, #9 | " " " " | =1 if 26 years or over<br>=0 otherwise |

TABLE 1.1

DESCRIPTION OF VARIABLES USED IN REGRESSION EQUATIONS TO ESTIMATE HUSBANDS INCOME

| Variable Name | Variable Number | Census Tape Variable Number | Description of Variables | Recode |
|---|---|---|---|---|
| AGEL1 | 14 | #6 | Age of person = 30-34 | =1 if yes<br>=0 otherwise |
| AGEL2 | 15 | #6 | " " " = 35-39 | =1 if yes<br>=0 otherwise |
| AGEL3 | 16 | #6 | " " " = 40-44 | =1 if yes<br>=0 otherwise |
| AGEL4 | 17 | #6 | " " " = 45-50 | =1 if yes<br>=0 otherwise |
| AGE | 18 | #6 | Age of person in years | |
| FREIGN | 19 | #15 | Foreign Born | =1 if yes<br>=0 otherwise |
| SOBORN | 20 | #16 | Born in South | =1 if yes<br>=0 otherwise |
| TIMIN | 21 | #23 | Length of time in same place in years | 01-05 = 01-05<br>06 = 8<br>07 = 15<br>08 = 25<br>09 = 25 |
| SAMST | 22 | #25 | Residence in same state as 1955 | =1 if yes, #25=1-5<br>=0 otherwise |
| EDAS10 | 23 | #75 | Highest grade completed by husband=10 years or less | =1 if #75 < 7<br>=0 otherwise |
| EDAS11 | 24 | #75 | Highest grade completed by husband=11 years | =1 if #75=7<br>=0 otherwise |
| EDAS12 | 25 | #75 | Highest grade completed by husband=12 years | =1 if #75=8<br>=0 otherwise |
| EDAS13 | 26 | #. | Highest grade completed by husband=13 years | =1 if #75=9<br>=0 otherwise |
| EDAS14 | 27 | #75 | Highest grade completed by husband=14-15 years | =1 if #75=10<br>=0 otherwise |

TABLE 1.1

DESCRIPTION OF VARIABLES USED IN REGRESSION EQUATIONS TO ESTIMATE HUSBANDS INCOME

| Variable Name | Variable Number | Census Tape Variable Number | Description of Variables | Recode |
|---|---|---|---|---|
| EDAS16 | 28 | #75 | Highest grade completed by husband = 16 years | =1 if #75=11<br>=0 otherwise |
| EDAS18 | 29 | #75 | Highest grade completed by husband = 18 years | =1 if #75=12<br>=0 otherwise |
| CHLDRN | 30 | #37 | Number of children ever born | |
| ASCINC | 31 | #82 | Total income of husband in 1959 | |
| TOTINC | 32 | #111 | Total income of person in 1959 | |
| ERNINC | 33 | #110, #111 | Total earnings of person in 1959, self employment plus wage and salary income | |
| FAMINC | 34 | #112 | Total family income in 1959 | |

TABLE 1.2

REGRESSION EQUATIONS:

White Females Excluding Those with Spanish Surname, Age 30-50, Not in School, Married with Spouse Present, Living Outside South. Dependent Variable is the Income of Husband.

| | (Level of Educational Attainment of Woman) | | | | |
|---|---|---|---|---|---|
| | 11 | 12 | 13-15 | 16 | 17+ |
| CONST | 544.99 | 605.23 | 3684.2 | -14010.0* | -12680.0 |
| SIZEPL | 64.16 | 8.2764 | 172.63 | 72.089 | 1132.9* |
| RURBM | 1295.3** | 828.07** | 1695.4** | 1921.0* | 2196.0* |
| RURBN | -554.68 | -826.46** | -1822.0 | 2870.8** | -1209.7 |
| RRNFN | -1749.9* | -2307.9** | -114.06 | -933.00 | -8618.1 |
| RRFN | -1435.6* | -1196.4** | -2563.7 | -3103.8* | 3853.9* |
| MARST | -370.81 | -775.15** | -711.13 | -2664.5* | 3428.2* |
| AGEM17 | 107.42 | -14.973 | -487.09 | 457.1 | 135.90 |
| AGEM18 | -881.01* | 50.824 | -363.96 | 974.26 | -3222.4 |
| AGEM22 | -1442.9* | -195.23 | -422.39 | -455.38 | -3369.5* |
| AGEM24 | -726.2 | -152.72 | -1276.0* | -1904.3* | -3907.0* |
| AGEM26 | -1792.6** | -1039.0** | -2267.3** | -3364.9** | -5412.0* |
| AGEL2 | -859.56* | -193.28 | 1021.9* | -1913.3* | -1222.5 |
| AGEL3 | -870.4 | -628.77* | 1979.0* | -894.04 | -2619.8 |
| AGEL4 | -1718.9 | -1436.9* | 853.25 | -3521.1 | -708.36 |
| AGE | 190.2* | 183.1** | 80.595 | 608.85** | 327.24 |
| FREIGN | 294.68 | -23.96 | -2133.7* | 1187.9 | -3459.9* |
| SOBORN | -1178.3* | 471.22* | 543.56 | 3308.4** | 3808.9* |
| TIMIN | -69.887** | -44.58** | 10.49 | 18.334 | 136.58 |
| SAMEST | 484.9 | 696.34** | 751.41* | 2316.2* | 2556.3* |
| EDASIO | -978.46** | -1102.8** | -1849.9** | -4862.0** | 347.81 |
| EDASI1 | -95.797 | -832.69** | 449.09 | -5217.4* | -2186.1 |
| EDASI3 | 1013.5 | 882.73** | 779.91 | 132.82 | 5015.7 |
| EDASI4 | 2293.8** | 1986.7** | 1624.9** | 1408.4 | 3870.5* |
| EDASI6 | 7342.9** | 3025.3** | 4360.3** | 4762.4** | 8674.3** |
| EDASI8 | 10090** | 5236.5** | 5601.6** | 5440.3** | 9216.9** |
| N= | 779 | 5535 | 1488 | 656 | 196 |
| $R^2$ | .16 | .087 | .126 | .164 | .194 |

* t ratio > 1.0

** t ratio > 2.0

# Table 1.3* -Earned degrees conferred, by level, institutional control, and sex: Aggregate United States, 1947-48 through 1964-65

| Level and year | Total | | | Public | | | Private | | |
|---|---|---|---|---|---|---|---|---|---|
| | Men and Women | Men | Women | Total | Men | Women | Total | Men | Women |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| **Bachelor's and first-professional degrees** | | | | | | | | | |
| 1964-65 total | 538,930 | 319,670 | 219,260 | 307,131 | 177,645 | 129,486 | 231,799 | 142,025 | 89,774 |
| Bachelor's (requiring 4 but less than 5 years) | 492,984 | 279,777 | 213,207 | 289,020 | 161,723 | 127,297 | 203,964 | 118,054 | 85,910 |
| First-professional requiring 5 or more years | 45,946 | 39,893 | 6,053 | 18,111 | 15,922 | 2,189 | 27,835 | 23,971 | 3,864 |
| 1963-64 total | 502,104 | 299,813 | 202,291 | 281,694 | 163,691 | 118,003 | 220,410 | 136,122 | 84,288 |
| Bachelor's (requiring 4 but less than 5 years) | 460,467 | 263,121 | 197,346 | 265,821 | 149,534 | 116,287 | 194,646 | 113,587 | 81,059 |
| First-professional requiring 5 or more years | 41,637 | 36,692 | 4,945 | 15,873 | 14,157 | 1,716 | 25,764 | 22,535 | 3,229 |
| 1962-63 total | 450,592 | 274,750 | 175,842 | 247,624 | 146,938 | 100,686 | 202,968 | 127,812 | 75,156 |
| Bachelor's (requiring 4 but less than 5 years) | 410,421 | 239,108 | 171,313 | 232,595 | 133,594 | 99,001 | 177,826 | 105,514 | 72,312 |
| First-professional requiring 5 or more years | 40,171 | 35,642 | 4,529 | 15,029 | 13,344 | 1,685 | 25,142 | 22,298 | 2,844 |
| 1961-62 total | 420,485 | 262,015 | 158,470 | 229,387 | 139,672 | 89,715 | 191,098 | 122,343 | 68,755 |
| Bachelor's (requiring 4 but less than 5 years) | 382,822 | 228,445 | 154,377 | 216,148 | 127,729 | 88,419 | 166,674 | 100,716 | 65,958 |
| First-professional requiring 5 or more years | 37,663 | 33,570 | 4,093 | 13,239 | 11,943 | 1,296 | 24,424 | 21,627 | 2,797 |
| 1960-61 total | 401,784 | 255,900 | 145,884 | 218,060 | 136,063 | 81,997 | 183,724 | 119,837 | 63,887 |
| Bachelor's (requiring 4 but less than 5 years) | 365,337 | 223,427 | 141,910 | 205,214 | 124,476 | 80,738 | 160,123 | 98,951 | 61,172 |
| First-professional requiring 5 or more years | 36,447 | 32,473 | 3,974 | 12,846 | 11,587 | 1,259 | 23,601 | 20,886 | 2,715 |
| 1959-60 | 394,889 | 255,504 | 139,385 | 214,720 | 136,504 | 78,216 | 180,169 | 119,000 | 61,169 |
| 1958-59 | 385,151 | 254,868 | 130,283 | 210,584 | 136,808 | 73,776 | 174,567 | 118,060 | 56,507 |
| 1957-58 | 365,748 | 242,948 | 122,800 | 198,731 | 129,585 | 69,146 | 167,017 | 113,363 | 53,654 |
| 1956-57 | 340,347 | 222,738 | 117,609 | 181,030 | 115,308 | 65,722 | 159,317 | 107,430 | 51,887 |
| 1955-56 | 311,298 | 199,571 | 111,727 | 162,237 | 100,127 | 62,110 | 149,061 | 99,444 | 49,617 |
| 1954-55 | 287,401 | 183,602 | 103,799 | 147,404 | 89,246 | 58,158 | 139,997 | 94,356 | 45,641 |
| 1953-54 | 292,880 | 187,500 | 105,380 | 148,330 | 89,941 | 58,389 | 144,550 | 97,559 | 46,991 |
| 1952-53 | 304,857 | 200,820 | 104,037 | 155,609 | 97,386 | 58,223 | 149,248 | 103,434 | 45,814 |
| 1951-52 | 331,924 | 227,029 | 104,895 | 163,856 | 107,149 | 56,707 | 168,068 | 119,880 | 48,188 |
| 1950-51 | 384,352 | 279,343 | 105,009 | 193,845 | 137,668 | 56,177 | 190,507 | 141,675 | 48,832 |
| 1949-50 | 433,734 | 329,819 | 103,915 | 217,389 | 162,754 | 54,635 | 216,345 | 167,065 | 49,280 |
| 1948-49 | 366,698 | 264,222 | 102,476 | 180,828 | 127,252 | 53,576 | 185,870 | 136,970 | 48,900 |
| 1947-48 | 272,311 | 176,146 | 96,165 | 136,180 | 86,829 | 49,351 | 136,131 | 89,317 | 46,814 |
| **Master's degrees** | | | | | | | | | |
| 1964-65 | 112,195 | 76,211 | 35,984 | 68,199 | 46,477 | 21,722 | 43,996 | 29,734 | 14,262 |
| 1963-64 | 101,122 | 69,012 | 32,110 | 62,363 | 42,710 | 19,653 | 38,759 | 26,302 | 12,457 |
| 1962-63 | 91,418 | 62,944 | 28,474 | 54,942 | 37,945 | 16,997 | 36,476 | 24,999 | 11,477 |
| 1961-62 | 84,889 | 58,705 | 26,184 | 50,663 | 35,194 | 15,469 | 34,226 | 23,511 | 10,715 |
| 1960-61 | 78,269 | 54,158 | 24,111 | 46,244 | 32,116 | 14,128 | 32,025 | 22,042 | 9,983 |
| 1959-60 | 74,497 | 50,937 | 23,560 | 42,991 | 29,324 | 13,667 | 31,506 | 21,613 | 9,893 |
| 1958-59 | 69,584 | 47,408 | 22,176 | 40,403 | 27,560 | 12,843 | 29,181 | 19,848 | 9,333 |
| 1957-58 | 65,614 | 44,252 | 21,362 | 37,954 | 25,695 | 12,259 | 27,660 | 18,557 | 9,103 |
| 1956-57 | 61,955 | 41,332 | 20,623 | 35,161 | 23,449 | 11,712 | 26,794 | 17,883 | 8,911 |
| 1955-56 | 59,294 | 39,397 | 19,897 | 33,095 | 21,874 | 11,221 | 26,199 | 17,523 | 8,676 |
| 1954-55 | 58,204 | 38,740 | 19,464 | 32,291 | 21,416 | 10,875 | 25,913 | 17,324 | 8,589 |
| 1953-54 | 56,823 | 38,147 | 18,676 | 30,701 | 20,578 | 10,123 | 26,122 | 17,569 | 8,553 |
| 1952-53 | 61,023 | 40,989 | 20,034 | 31,113 | 21,082 | 10,031 | 29,910 | 19,907 | 10,003 |
| 1951-52 | 63,587 | 43,591 | 19,996 | 31,527 | 21,867 | 9,660 | 32,060 | 21,724 | 10,336 |
| 1950-51 | 65,132 | 46,231 | 18,901 | 31,472 | 22,932 | 8,540 | 33,660 | 23,299 | 10,361 |
| 1949-50 | 58,219 | 41,237 | 16,982 | 26,192 | 18,998 | 7,194 | 32,027 | 22,239 | 9,788 |
| 1948-49 | 50,763 | 35,224 | 15,539 | 21,056 | 15,028 | 6,028 | 29,707 | 20,196 | 9,511 |
| 1947-48 | 42,449 | 28,939 | 13,510 | 17,696 | 12,892 | 4,804 | 24,753 | 16,047 | 8,706 |
| **Doctor's Degrees** | | | | | | | | | |
| 1964-65 | 16,467 | 14,692 | 1,775 | 9,472 | 8,623 | 849 | 6,995 | 6,069 | 926 |
| 1963-64 | 14,490 | 12,955 | 1,535 | 8,194 | 7,453 | 741 | 6,296 | 5,502 | 794 |
| 1962-63 | 12,822 | 11,448 | 1,374 | 7,084 | 6,512 | 572 | 5,738 | 4,936 | 802 |
| 1961-62 | 11,622 | 10,377 | 1,245 | 6,296 | 5,743 | 553 | 5,326 | 4,634 | 692 |
| 1960-61 | 10,575 | 9,463 | 1,112 | 5,584 | 5,126 | 458 | 4,991 | 4,337 | 654 |
| 1959-60 | 9,829 | 8,801 | 1,028 | 5,098 | 4,635 | 463 | 4,731 | 4,166 | 565 |
| 1958-59 | 9,360 | 8,371 | 989 | 4,850 | 4,438 | 412 | 4,510 | 3,933 | 577 |
| 1957-58 | 8,942 | 7,978 | 964 | 4,614 | 4,173 | 441 | 4,328 | 3,805 | 523 |
| 1956-57 | 8,756 | 7,817 | 939 | 4,484 | 4,088 | 396 | 4,272 | 3,729 | 543 |
| 1955-56 | 8,903 | 8,018 | 885 | 4,583 | 4,169 | 414 | 4,320 | 3,849 | 471 |
| 1954-55 | 8,840 | 8,014 | 826 | 4,560 | 4,188 | 372 | 4,280 | 3,826 | 454 |
| 1953-54 | 8,996 | 8,181 | 815 | 4,656 | 4,339 | 317 | 4,340 | 3,842 | 498 |
| 1952-53 | 8,309 | 7,517 | 792 | 4,127 | 3,799 | 328 | 4,182 | 3,718 | 464 |
| 1951-52 | 7,683 | 6,969 | 714 | 3,469 | 3,195 | 274 | 4,214 | 3,774 | 440 |
| 1950-51 | 7,338 | 6,664 | 674 | 3,043 | 2,834 | 209 | 4,295 | 3,830 | 465 |
| 1949-50 | 6,420 | 5,804 | 616 | 2,663 | 2,453 | 210 | 3,752 | 3,346 | 406 |
| 1948-49 | 5,050 | 4,528 | 522 | 1,936 | 1,834 | 102 | 3,054 | 2,694 | 360 |
| 1947-48 | 3,989 | 3,496 | 493 | 1,580 | 1,435 | 145 | 2,409 | 2,061 | 348 |

*Department of Health, Education and Welfare, Office of Education: Annual Report "Earned Degrees Conferred 1964-65", p. 4.